

REMARKS

Claims 1-5, 7, 23, 25, 26, and 33 and 34 are currently pending in the subject application and are presently under consideration. Claims 1, 7, and 34 have been amended as shown on pp. 2-4 of the Reply.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I. Rejection of Claim 34 Under 35 U.S.C §112

Claim 34 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 34 is amended herein to particularly point out and distinctly claim the subject matter which applicant regards as the invention, and the withdrawal of this rejection is respectfully requested.

II. Rejection of Claims 1-5, 7, 23, 25,-27, 33 and 34 Under 35 U.S.C. §103(a)

Claims 1-5, 7, 23, 25,-27, 33 and 34 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Dhindsa *et al.* (US 5,740,016, hereinafter Dhindsa) in view of Saika (US 6,573,596) and Morris *et al.* (US 6,230,497, hereinafter Morris). It is respectfully submitted that this rejection should be withdrawn for at least the following reasons. Dhindsa, Saika, and Morris, either alone or in combination, do not disclose or suggest each and every feature of the claimed subject matter. Additionally, the combination of Dhindsa, Saika, and Morris is inoperable.

Applicant's claimed subject matter relates generally to regulating heat flow in an integrated circuit (IC) during normal operation of the IC in order to reduce stress on the IC during operation and extend the operating life of the IC. A plurality of strategically placed and shaped thermo-electrical structures remove heat from hot-spots on the IC during operation to reduce stress. The thermo-electrical structures may also add heat to cool-spots during operation to further reduce stress.

In contrast, Dhindsa uses thermo-electrical structures to reduce stress on semi-conductor wafers during chip fabrication in order to yield more chips from a single wafer. Saika also discloses thermo-electrical cooling on a semiconductor wafer, as opposed to an integrated circuit

during operation. Only Morris discloses a method of cooling an integrated circuit designed for use during operation. The systems of Dhindsa and Saika would be rendered non-functional by a combination with Morris.

Independent claim 1 recites: “...*regulating a heat flow into and out of an integrated circuit semiconductor body **during operation**...each of the thermo-electrical structures has a structure of line patterns selected from a group comprising: **helix structure and a spring structure.***” The cited art does not disclose or suggest such features. As described above, Dhindsa is silent regarding temperature regulation of a semiconductor during operation. Additionally, Dhindsa does not disclose a helix structure or a spring structure. The Office Action points to Figure 2a as disclosing these shapes for the thermo-electrical structures, however applicant’s representative respectfully disagrees. Dhindsa states “As shown in FIG 2a, the thermoelectric modules may be arranged in concentric circles.” (Col 5, lines 27-28) Saika and Morris are both silent regarding helical structures, as well as spring shaped structures, and as such fail to cure the deficiencies of Dhindsa.

Independent claims 7 and 34 recite similar features to those found in independent claim 1. In particular, claim 7 recites: “...*regulating a heat flow of an integrated circuit **during operation**...each of the thermo-electrical structures has a structure of line patterns selected from a group comprising: **helix structure and a spring structure.***” Claim 34 recites: “*reducing the accumulation and concentration of stress in an integrated circuit **during operation**... each of the thermo-electrical structures has a structure of line patterns selected from a group comprising: **helix structure, and a spring structure...***” As discussed above, the cited art does not disclose or suggest such features.

In view of at least the foregoing, it is respectfully submitted that neither Dhindsa, nor Saika, nor Morris, alone or in combination, disclose or suggest each and every feature of applicants’ invention as recited in independent claims 1, 7, and 34 (and claims 2-5, 23, 25, 26, and 33 which depend respectively there from). Additionally, it is respectfully submitted that the combination of Morris with Dhindsa and Saika is inoperable. Accordingly, withdrawal of this rejection is respectfully requested.

CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [AMDP812US].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,
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